



(11) **EP 4 369 584 A3**

(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:  
**05.06.2024 Bulletin 2024/23**

(43) Date of publication A2:  
**15.05.2024 Bulletin 2024/20**

(21) Application number: **23210808.4**

(22) Date of filing: **28.01.2019**

(51) International Patent Classification (IPC):  
**H02S 10/00** <sup>(2014.01)</sup> **H02M 1/12** <sup>(2006.01)</sup>  
**H02M 1/36** <sup>(2007.01)</sup> **H02M 7/12** <sup>(2006.01)</sup>  
**H02M 7/44** <sup>(2006.01)</sup> **H02M 1/32** <sup>(2007.01)</sup>

(52) Cooperative Patent Classification (CPC):  
**H02M 1/36; H02M 1/32; H02M 1/123; H02M 7/125; H02M 7/44; Y02E 10/50**

(84) Designated Contracting States:  
**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR**

(62) Document number(s) of the earlier application(s) in accordance with Art. 76 EPC:  
**19912702.8 / 3 893 388**

(71) Applicant: **Huawei Digital Power Technologies Co., Ltd.**  
**Shenzhen, 518043 (CN)**

(72) Inventors:  
• **GAO, Yongbing**  
**SHENZHEN 518129 (CN)**  
• **WANG, Chen**  
**SHENZHEN 518129 (CN)**  
• **LIU, Zhaopeng**  
**SHENZHEN 518129 (CN)**

(74) Representative: **Körber, Martin Hans Mitscherlich PartmbB**  
**Patent- und Rechtsanwälte**  
**Karlstraße 7**  
**80333 München (DE)**

(54) **DEVICE, METHOD, AND SYSTEM FOR RESOLVING COMMON-MODE VOLTAGE INTERFERENCE**

(57) This application discloses a device, a method, and a system for resolving common-mode voltage interference. The device is applied to a power supply system, the power supply system includes a power converter and a switch mechanism, each phase of an output end of the power converter is connected to a downstream circuit by using the switch mechanism, the power converter is configured to perform electric energy conversion, the switch mechanism includes a first switch component and a second switch component that are connected in series, the device includes a controller and a passive component, two ends of the first switch component in at least one phase of the output end of the power converter are connected in parallel to the passive component, and the controller is configured to: control the second switch component to be turned on, and when a voltage difference between the two ends of the first switch component is less

than a preset voltage, control the first switch component to be turned on. When the second switch component connected in series to the first switch component is turned on first, a high-voltage end charges a low-voltage end by using the passive component, to reduce the voltage difference between the two ends of the first switch component. After the voltage difference between the two ends of the first switch component is less than the preset voltage, the first switch component is turned on. In this case, a case in which there is a very large sudden change between voltages at the two ends of the first switch component due to closing of the first switch component does not occur, so that a common-mode current can be reduced, a power supply risk can be prevented in the power supply system, and the switch component is protected, thereby prolonging a service life of the switch component.

**EP 4 369 584 A3**



## EUROPEAN SEARCH REPORT

Application Number

EP 23 21 0808

5

10

15

20

25

30

35

40

45

50

55

## DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	US 2017/294847 A1 (XIE WEI [CN] ET AL) 12 October 2017 (2017-10-12) * figures 2,4a,7 * * paragraph [0003] - paragraph [0005] * * paragraph [0037] - paragraph [0039] * * paragraph [0047] * -----	1-6	INV. H02S10/00 H02M1/12 H02M1/36 H02M7/12 H02M7/44 H02M1/32
A	EP 3 098 953 A2 (SUNGROW POWER SUPPLY CO LTD [CN]) 30 November 2016 (2016-11-30) * figures 3a,3b,5a * * paragraph [0036] - paragraph [0037] * * paragraph [0041] * -----	1-6	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)  H02M
Place of search <b>The Hague</b>			Examiner <b>Gusia, Sorin</b>
Date of completion of the search <b>25 April 2024</b>			
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			
T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ..... & : member of the same patent family, corresponding document			

2  
EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 23 21 0808

5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
The members are as contained in the European Patent Office EDP file on  
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

25-04-2024

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
<b>US 2017294847 A1</b>	<b>12-10-2017</b>	<b>CN 107276378 A</b>	<b>20-10-2017</b>
		<b>US 2017294847 A1</b>	<b>12-10-2017</b>
-----			
<b>EP 3098953 A2</b>	<b>30-11-2016</b>	<b>CN 104967300 A</b>	<b>07-10-2015</b>
		<b>EP 3098953 A2</b>	<b>30-11-2016</b>
		<b>JP 6295485 B2</b>	<b>20-03-2018</b>
		<b>JP 2016226272 A</b>	<b>28-12-2016</b>
		<b>US 2016352252 A1</b>	<b>01-12-2016</b>
-----			